

### **REMARKS**

Claims 1-30 and 51-60 are pending in the present application. Claims 1, 16, and 19 are independent claims.

### **DRAWINGS**

The Examiner asserts that Figures 2, 3a-3b and possibly Figures 4 and 10 should be designated by a legend such as "Prior Art". Although Applicants do not admit that the subject matter of Figures 2, 3a-3b, 4, and 10 is prior art, Applicants acknowledge that the teachings illustrated in these figures may have preceded the filing date of the present application. Accordingly, the Applicants direct the Examiner's attention to the replacement figures for Figures 2, 3a-3b, 4 and 10, in which these figures are labeled "Conventional Art". In light of the replacement sheets, Applicants request withdrawal of this objection.

### **EXAMPLE EMBODIMENTS OF THE PRESENT INVENTION**

Example embodiments of the present invention are illustrated in Figs. 8A, 9A, and 11, and generally recited in independent claims 1, 16, and 19. Independent claim 1 recites a method of removing a photoresist from a substrate which includes treating the photoresist with a first reactant (for example, supercritical carbon dioxide (SCCO<sub>2</sub>)) to cause swelling, cracking, or delamination of the photoresist, treating the photoresist with a second reactant (for example, an ozone-based reactant, such as ozone vapor or ozone gas mixed with water vapor), and removing the chemically altered photoresist with a third reactant (for example, deionized water).

Independent claim 16 recites treating the photoresist with supercritical SCCO<sub>2</sub>, treating the photoresist with an ozone-based reactant, and removing the photoresist with deionized water.

Independent claim 19 recites loading the substrate into a chamber, injecting a first reactant (for example, carbon dioxide) into the chamber and converting the first reactant (carbon dioxide) to supercritical conditions, maintaining contact between the substrate and the supercritical first reactant, depressuring the chamber, injecting a second reactant (for example, an ozone-based reactant), into the chamber, maintaining contact between the substrate and the second reactant, purging the chamber and unloading the substrate, removing the photoresist, and drying the substrate.

### **CLAIM OBJECTIONS**

The Examiner has objected to claim 13 asserting that the term “normal” does not further limit the claim. Applicants respectfully traverse this objection.

As set forth on page 2 of the present specification, example embodiments may be used to remove “normal” photoresist in addition to the hard outer crust, for example, the hard outer crust 70', illustrated in Figure 3A. Accordingly, Applicants respectfully assert that the phrase “normal photoresist” defines a photoresist other than a hard outer crust 70'.

Reconsideration and withdrawal of this rejection is requested.

### **35 U.S.C. § 102(e) VAARTSTRA REJECTION**

Claims 1-2, 4-9, 13-15, 19, 21-23, 29-30, 51-53, 55, and 57-59 have again been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,770,426 to Vaartstra, as evidenced by U.S. Patent Publication 2002/014257 to Chandra et al. or WO patent publication WO 02/11191. This rejection, insofar as it pertains to the currently pending claims, is respectfully traversed for the following reasons.

In Applicants' previous response of December 29, 2005, Applicants asserted that Vaartstra discloses two specific composition embodiments which clearly indicate that the first reactant, the second reactant, and/or third reactant of Vaartstra are all applied to the photoresist **at the same time**, as part of the composition. In contrast, in example embodiments of the present invention, the first reactant, the second reactant, and third reactant are applied to the photoresist sequentially (albeit in all different orders) or sequentially in a specific order.

The Examiner attempts to bolster her rejection based on Vaartstra by utilizing U.S. Patent Publication 2002/014257 to Chandra et al. or WO patent publication WO 02/11191. The Examiner further attempts to define the phrase "sequentially treating" broadly as meaning any order.

The Examiner also appears to adopt a strained interpretation to conclude that Vaartstra teaches sequential treating. The Examiner asserts that Vaartstra inherently has treating with the first reactant to cause swelling. Thereafter, the swelling allows for the subsequent, second treatment to be successful, (i.e., for chemically treating or oxidizing). Essentially, what the Examiner seems to be arguing is that the results of **swelling** and **chemically altering** in Vaartstra occur sequentially.

However, Applicants assert that a distinguishing feature between example embodiments and Vaartstra is that **the reactants are supplied sequentially, not the results that those reactants facilitate occur sequentially**. In Vaartstra, all reactants are supplied together as part of the same composition. Applicants assert that none of Chandra, the WO publication WO 02/11191 and Mullee (used in rejections discussed below), either alone, or bolstered by the Examiner's logic, teach such a feature.

Additionally, the Examiner seems to be asserting on page 11 of the Office Action that since sequential treatments may overlap and the application of reactants in Vaartstra overlap (they are simultaneous), Vaartstra teaches sequential application of reactants. Applicants assert the Examiner is incorrect on this point. A commonly accepted definition of “sequential” is “...a following of one thing after another...”

An example (1) of sequential (without overlap) is illustrated below:

First reactant

I-----I

Second reactant

I-----I

Third reactant

I-----I.

Another example (2) of sequential which includes overlap, is illustrated below:

First reactant

I-----I

Second reactant

I-----I

Third reactant

I-----I.

However, the arrangement in Vaartstra (3) may be illustrated below.

First reactant

I-----I

Second reactant

I-----I

Third reactant

I-----I

Applicants assert a distinguishing feature of “sequential” treatment is the fact that the reactants are introduced at different times, not that they overlap at some point. As a result, Applicants assert Examples (1) and (2) are both covered by independent claims 1 and 19 (among other claims), whereas Example (3) is taught by Vaartstra and Example (3) does not anticipate or render obvious Examples (1) or (2).

Applicants respectfully submit that independent claims 1 and 19 are directed to distinct, sequential operations, which Vaartstra’s compositions cannot provide. Accordingly, Applicants respectfully submit that independent claims 1 and 19 are patentable over Vaartstra, for at least this reason.

Applicants respectfully submit that dependent claims 2, 4-9, 13-15, 21-23, 29-30, 51-53, 55, and 57-59 are allowable by virtue of their dependency on allowable independent claims 1 or 19, for at least the reasons set forth above.

### **35 U.S.C. § 102(e) MULLEE REJECTION**

Claims 1-2, 4, 6-8, 11-16, 19-21, 23-24, 28-30, and 51-60 have been rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent 6,306,564 to Mullee, as evidenced by U.S. Patent Publication 2002/014257 to Chandra et al. or WO patent publication WO 02/11191.

This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

As set forth above, Applicants assert that a distinguishing feature between example embodiments and Vaartstra is that **the reactants are supplied sequentially, not the results that those reactants facilitate occur sequentially**. Applicants assert that none of Chandra, the WO publication WO 02/11191 and Mullee, either alone, or bolstered by the Examiner's logic, teach such a feature.

Accordingly, Applicants respectfully submit that independent claims 1 and 19 are patentable over Mullee, for at least this reason.

Applicants respectfully submit that dependent claims 2, 4-9, 13-15, 21-23, 29-30, 51-53, 55, and 57-59 are allowable by virtue of their dependency on allowable independent claims 1 or 19, for at least the reasons set forth above.

**35 U.S.C. § 103(a) VAARTSTRA/LIU/SHIBATA REJECTION**

Claim 3 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaartstra in view of two publications, namely Liu and Shibata. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that Liu and Shibata fail to make up for the deficiency discussed above with respect to Vaartstra and independent claim 1. Accordingly, Applicants respectfully submit that dependent claim 3 is allowable over this combination at least by virtue of its dependency on allowable independent claim 1, for the reasons set forth above.

Applicants further respectfully submit that the Examiner's rejection of claim 3 under 35 U.S.C. § 103(a) is deficient for failure to provide proper motivation for combining Vaartstra,

Liu, and/or Shibata. Accordingly, Applicants respectfully submit that dependent claim 3 is allowable for this additional reason.

**35 U.S.C. § 103(a) MULLEE/VAARTSTRA/LIU/SHIBATA REJECTION**

Claim 3 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Mullee, Vaartstra, Liu and Shibata. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that Liu and Shibata fail to make up for the deficiency discussed above with respect to Vaartstra and Mullee and independent claim 1. Accordingly, Applicants respectfully submit that dependent claim 3 is allowable over this combination at least by virtue of its dependency on allowable independent claim 1, for the reasons set forth above.

Applicants further respectfully submit that the Examiner's rejection of claim 3 under 35 U.S.C. § 103(a) is deficient for failure to provide proper motivation for combining Mullee Vaartstra, Liu, and/or Shibata. Accordingly, Applicants respectfully submit that dependent claim 3 is allowable for this additional reason.

**35 U.S.C. § 103(a) MULLEE/VAARTSTRA REJECTION**

Claims 5, 17 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mullee in view of Vaartstra. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that Vaartstra fails to make up for the deficiency discussed above with respect to Mullee and independent claims 1 and 19. Accordingly, Applicants respectfully submit that dependent claims 5, 17 and 22 are allowable over this combination at

least by virtue of their dependency on allowable independent claims 1 and 19, for the reasons set forth above.

Applicants further respectfully submit that the Examiner's rejection of claims 5, 17 and 22 under 35 U.S.C. § 103(a) is deficient for failure to provide proper motivation for combining Mullee and Vaartstra. Accordingly, Applicants respectfully submit that dependent claims 5, 17 and 22 are allowable for this additional reason.

### **35 U.S.C. § 103(a) MULLEE REJECTION**

Claims 9-10, 18, and 25-27 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Mullee. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that dependent claims 9-10, 18, and 25-27 are allowable over this combination at least by virtue of their dependency on allowable independent claims 1 and 19, for the reasons set forth above.

### **35 U.S.C. § 103(a) VAARTSTRA/TIPTON/MATSUDA REJECTION**

Claims 7-10, 24, 27 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaartstra in view of Tipton and Matsuda. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that Tipton and Matsuda fail to make up for the deficiency discussed above with respect to Vaartstra and independent claims 1 and 19. Accordingly, Applicants respectfully submit that dependent claims 7-10, 24, 27 and 30 are allowable over this



combination at least by virtue of their dependency on allowable independent claims 1 and 19, for the reasons set forth above.

Applicants further respectfully submit that the Examiner's rejection of claims 7-10, 24, 27 and 30 under 35 U.S.C. § 103(a) is deficient for failure to provide proper motivation for combining Vaartstra, Tipton, and/or Matsuda. Accordingly, Applicants respectfully submit that dependent claims 7-10, 24, 27 and 30 are allowable for this additional reason.

**35 U.S.C. § 103(a) VAARTSTRA/MATSUDA REJECTION**

Claims 11-12, 16-17, 28, 54, 56 and 60 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaartstra in view of Matsuda. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that Matsuda fails to make up for the deficiency discussed above with respect to Vaartstra and independent claims 1 and 19. Accordingly, Applicants respectfully submit that dependent claims 11-12, 16-17, 28, 54, 56 and 60 are allowable over this combination at least by virtue of their dependency on allowable independent claims 1 and 19, for the reasons set forth above.

Applicants further respectfully submit that the Examiner's rejection of claims 11-12, 16-17, 28, 54, 56 and 60 under 35 U.S.C. § 103(a) is deficient for failure to provide proper motivation for combining Vaartstra and Matsuda. Accordingly, Applicants respectfully submit that dependent claims 11-12, 16-17, 28, 54, 56 and 60 are allowable for this additional reason.

**35 U.S.C. § 103(a) VAARTSTRA/TIPTON/MATSUDA REJECTION**

Claims 18, 20, 25-26 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaartstra in view of Tipton and Matsuda. This rejection, insofar as it pertains to the presently pertains, is respectfully traversed for the following reasons.

Applicants respectfully submit that Tipton and Matsuda fail to make up for the deficiency discussed above with respect to Vaartstra and independent claims 1 and 19. Accordingly, Applicants respectfully submit that dependent claims 18, 20, 25-26 and 30 are allowable over this combination at least by virtue of their dependency on allowable independent claims 1 and 19, for the reasons set forth above.

Applicants further respectfully submit that the Examiner's rejection of claims 18, 20, 25-26 and 30 under 35 U.S.C. § 103(a) is deficient for failure to provide proper motivation for combining Vaartstra, Tipton, and/or Matsuda. Accordingly, Applicants respectfully submit that dependent claims 18, 20, 25-26 and 30 are allowable for this additional reason.

**CONCLUSION**

In view of the above amendments and remarks, reconsideration of the various rejections and allowance of each of claims 1-30 and 51-60 is respectfully requested

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John A. Castellano, Reg. No. 35,094 at the telephone number of the undersigned below.

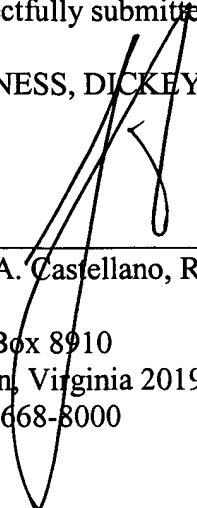
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any

additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKY, & PIERCE, P.L.C.

By

  
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